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MONTHLY REPORT
OFFICE OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

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Monthly

MONTHLY REPORT

OFFICE OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

June, 1924

FOREST EXPERIMENT STATIONS

Washington

During June we received the news that Congress had passed the $50,000 increase in the appropriations for silvical investigations which provides for the establishment of the work in the Pacific Northwest on a much more adequate scale than it has been before, and also for the material expansion of the work in the South. Mr. T. T. Munger, in charge of timber sales in District 6, has accepted appointment as the director of this station, whose name has been approved by the Forester as "Pacific Northwest Forest Experiment Station." Mr. Leo A. Isaac, who was recently transferred from the Chelan to the District office, will be assigned to the station staff, and Miss Wertz, in the office of Forest Management in Portland, will be the chief clerk of the new station. Mr. R. E. McArdle has been appointed as forest assistant from the register of this year and reported to Mr. Munger about the first of July. Other members of the station staff will be announced later.

No headquarters for the station have yet been selected and it is improbable that they will be announced before the early fall. For the present, at least, Mr. Munger should be addressed in care of the Forest Service at Portland.

The major work of the Pacific Northwest Station will include this field season a study of growth and yield of Douglas fir and the continuation of the fire studies initiated by Dr. Hofmann at the Wind River Station.

The work of the Southern Station will be materially expanded and Mr. Forbes arrived in Washington the latter part of June in order to make plans for the new work to be initiated soon after the first of July. The station staff will consist of the present members with the addition of Mr. Geo. B. Shivery, appointed as Forest Assistant from this year's eligible list. Mr. Shivery will report in Washington for a month's detail and will be engaged upon the southern pine growth study. Additional members have not yet been chosen. There

will be no change in the location of the headquarters for the present, at least. The new work to be undertaken this year will include a comprehensive survey of the condition of cut-over land in the South and the damage done by improper methods of turpentining in the eastern part of the territory. Plans are also under way for the development of additional naval stores work which will not be started until the beginning of the chipping season next spring.

Mr. Donald Bruce, formerly Supervisor in District 1 and later professor of Mensuration at the University of California, came to Washington on June 16, and, with Mr. R. M. Brown, began the rechecking of the southern pine growth data. Mr. Bruce plans to spend the major part of the summer on this work and it appears probable that additional field data will be necessary.

Mr. E. F. McCarthy, of the Appalachian Station, completed his work on which he was engaged during his detail in Washington and returned to the Appalachian Station about June 20. Through Mr. McCarthy's help a considerable number of things which had been held over were cleared up.

At the end of the month the Department found that it could take care of additional manuscripts before July 1, and at the same time we learned that the Journal of Agricultural Research was in dire need of manuscripts to fill out the year. The last few days of the month therefore found considerable rush work on hand in order to get these publications started to the printer. Reprints were ordered of one Departmental Bulletin and one Circular, and one manuscript about which some questions had been raised was rushed through to completion and furnished the printer. For the Journal of Agricultural Research, 7 articles were completed in time to be included in the fiscal year 1924 issues.

A check made of the manuscripts handled during the past year showed that 109 articles were submitted for publication, 77 of them being published. This included 5 bulletins, 3 circulars, 13 articles in the scientific press, 15 in forestry journals, 2 in State publications, 8 in forest school papers, 35 in trade journals, and 6 in agricultural and engineering papers.

The greater part of the time of the Office of Forest Measurements was spent on the southern pine growth study, with the regional volume table for western yellow pine coming as a close second. Plans have been initiated for the development of the statistical section in Forest Measurements, and a quantity of tabulating cards were prepared for use when the machines are set up.

DENDROLOGY

Reviews of Prospective Publications

Mr. F. L. Mulford, of the Office of Horticulture and Pomological Investigations, Bureau of Plant Industry, has prepared a bulletin for publication on "Trees for Roadside Planting," which by request has been reviewed and suggestions made for its betterment.

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Reviews of Prospective Publications

Mr. F. L. Mulford, of the Office of Horticulture and Pomological Investigations, Bureau of Plant Industry, has prepared a bulletin for publication on "Trees for Roadside Planting," which by request has been reviewed and suggestions made for its betterment.

Treatment of the subject included brief discussion of 32 different regions, into which the United States is divided on the basis of soil conditions, rainfall and temperature. Lists of native and exotic trees are suggested for roadside planting in each of these regions. For regions within abundant rainfall, where numerous trials have already been made, the selection of useful trees is comparatively easy, but in the arid and semi-arid sections of scanty rainfall, the problem is exceedingly difficult, particularly because a very limited number of experiments have been made which may serve as a guide. The species suggested for these regions are offered largely on the basis of likely behavior under untried conditions.

The bulletins contain brief descriptive notes on well-known trees used for shade and ornamental purposes, without reference to their fitness for any particular region.

"Fungous Diseases of the World and Their Host Plants," a bulletin prepared for publication by J. A. Stevenson, pathological inspector of the Federal Horticultural Board, is a voluminous document of 750 typewritten pages, which was critically reviewed in order to bring up to date the nomenclature of tree host-plants. The enumerated plant diseases were compiled, with the names of host plants, from thousands of different publications issued during the last thirty years. Necessarily the plant nomenclature thus brought together was at great variance with present-day usage.

This publication, the first of its kind attempted, will be of very great value to the Federal Horticultural Board in determining for quarantine purposes the presence in foreign countries of important plant diseases and the hosts they invade. It will also be of great reference value for all working mycologists.

Common Names Committee's Work Completed

The Common Names Committee has finished its work on the common names for trees of the new Check List and has presented its recommendations to the Branch of Research, from which they went to the Forester and have been approved.

In the course of its work the Committee encountered a difficult problem in disposing of such groups as Tilia, Acer, Celtis, Quercus, Betula, etc., each of which contain several species popularly well known by long-established common names, as well as a number of equally distinct species and varieties for which no common names exist. In a few cases easily seen distinguished characteristics of the latter forms furnished a basis for coining new names. In the case of a good many others the characteristics relied upon for botanical distinction are too abstruse to permit coining good common names. For these cases the Committee adopted the principle of applying modified or unmodified generic names. For example, no good names being coinable for 9 botanically distinct basswoods, among which is the common northeastern species formerly known as Tilia americana and generally called Basswood,

these also are to be called Basswood. Likewise, 4 basswoods, of which Tilia heterophylla, the well-known White Basswood, is the type, are also to be called White Basswood.

From the lumberman's standpoint, all of the basswoods furnish timber which in the manufactured state, is universally classed as basswood. From the forester's standpoint, future silvical studies may show that a number of the now indefinitely named basswoods are of superior silvicultural importance. Quite naturally, as necessity arises, the forester will be able to acquaint himself with the botanical distinctions of these now little-known basswoods.

Revision of Department Bulletin 863: Forestry Lessons on Home Woodlands

In preparing for a reprint of this publication, two sections of it, "Key to Common Kinds of Trees," and "One Hundred Important Forest Trees," were critically revised and largely re-written in order to render these parts more useful.

THE EDITOR'S OFFICE

Hot Weather Miscellany

Here follow a few of those curious ways of stating things that the "other fellow" is always guilty of, never one's self. The editor has collected them at odd moments as they passed over his desk, impartially and without any desire to carp unduly at the manuscripts thus pillaged.

Here is a writer who refers to "the critical world's timber-supply problem of the next half century." That's easier to point out than to put right. Our guess is: "The critical problem of the world's timber supply for the next half century." But it's a "critical world" at best, however one says it.

The same writer says: "If the United States elects to depend upon foreign supplies, we must look forward to increasing world competition, &c." That's another one of those expressions that is all right if approached from the right angle. The careless reader might get away with the notion that the U. S. must take an active part in increasing the competition.

Another writes: "The seed may be removed from the cones frequently only by agitation." But does not explain how to get 'em back in again each time. That "frequently" is a dangerous friend. It so often happens that the words we use betray us, not from any innate depravity on their part, but because of the company they get into on the typewritten page. For instance: "In Figure 2 the spacing is not even horizontally across the page, but up and down." See what "not" and "even" are up to the moment they get together! Has the author said, "the spacing is not even so much as horizontal, but only up and down?" No. He means, it is even, but up and down rather than horizontally across the page.

"The ages of the largest trees ranged between 20 and 25 years old." This is typical of a number of sentences that have been noted from time to time. It might be called the double-header. One can either amputate the first three words, or the last one. The writer forgets just how he started the sentence and so makes his ending duplicate his beginning.

The word "number" is confusing at times. The editor would judge both the following sentences to be correct, although in one case "number" takes a singular verb and in the other a plural verb: (1) "The total number of Douglas fir is shown in the table." (2) "A limited number of trees were studied." In brief, if you mean a number (arithmetical) the verb is singular. If you mean a group, a crowd (collective) it can be plural.

Appendicitis is a very common ailment in forestry rhetoric. An operation is always advisable, and should, if possible, be performed before the journey to Washington is undertaken. I refer to these expressions: "In this stand (a condition of) suppression was very evident." "In this region (the matter of) obtaining natural reproduction is often difficult." "In figure 10 (it will be seen that) the curves converge at a point..." "It may be well to repeat (what has been stated earlier), that..." The phrases in parentheses can well be dispensed with. "By virtue of their position in relation to light, dominant trees usually grow at a decidedly faster rate." This is a rather lofty expression even for such lofty trees. "Because they have more (or, the most) light, dominant trees..."

APPALACHIAN FOREST EXPERIMENT STATION

Methods of Cutting - Hardwoods (Mc-2)

After a few days preliminary work by Frothingham and Haasis on the Berea College forest, Berea, Ky., Haasis laid out 34 quadrats in the permanent sample plots established there last year. Two of the plots (6.3 acres) were marked for cutting last August. The logging was done by the college under the supervision of Mr. Ima Chesnut and was practically completed at the end of May. The cutting was of different degrees of severity, from clean cutting with seed trees to heavy selection aimed to release existing advance growth, largely of sugar maple.

The quadrats, which include two per cent of the plot area, are 33 feet long and about $5\frac{1}{4}$ feet wide and are distributed nearly evenly through the plots so that the records from them will be as nearly representative as possible. All young growth in the quadrats which is a foot or more high - up to 3.5 inches in diameter, breasthigh - now bears numbered tags and is recorded by species, actual height, and origin (sprout or seedling, advance growth or subsequent reproduction). In addition, a tally was made, by species, of the tree reproduction less than a foot high which was found on the quadrats. As much of this as

grows above one foot in height will be tagged and recorded at subsequent examinations. In this way it is planned to secure an accurate record of the progress of the reproduction which takes place naturally following the cutting.

Besides these ordinary quadrat records, however, it is proposed to secure special information as to the results of miscellaneous methods of treatment on designated portions of the plots. It may, for example, be desirable later on to test liberation or disengagement cuttings aimed to remove weeds and release seedlings or sprouts of desirable species which might otherwise be crowded out. This special work was initiated by placing 250 seed spots of yellow poplar seed at an end of one of the plots set aside for this purpose. Quadrats to determine the results of this were laid out as in the body of the plot where the progress of reproduction is being left to nature.

The dominant trees left in the marking - as well as a portion of the trees of lesser crown classes - were measured as to total height and crown length. Since they include a rather large number of hardwood species the determination of subsequent growth, both in diameter and crown extent, will be of decided interest in connection with the quadrat records showing the development of the oncoming young stand. As a standard by which to gauge both classes of results intact control plots were left last year adjacent to the plots cut over.

The Station has received effective cooperation from the Berea College authorities since the beginning of the investigations. Most of the labor for the non-technical part of the work was furnished by them through the agency of President Hutchins, Dean Clark, and the forest superintendent, I. B. Chesnut.

Oak Study (TS-12)

McCarthy returned from Washington on June 20, after a period of detail of seven weeks. While in Washington he examined the material previously collected and compiled in the study of oaks. From this review more definite plans were made and incorporated in the working plan for TS-12. The principal field work required is the addition of about 100 plots in the study of yield in second-growth stands and the preparation of adequate volume tables for second-growth oak, covering some six important species.

The typed manuscript on "The Northern and Interior Oaks," prepared by W. D. Sterrett contained a proposed universal volume table for oaks. In view of the progress in this direction which has been made since this table was prepared an attempt will be made during the current season to correlate form for all oaks, or otherwise for groups of oak, along somewhat different lines. If no correlation can be found, volume tables for individual species will be prepared.

Fire damage study (Pf-4)

Computation of records on permanent plots in McCarthy's fire damage study shows that the number of hardwood trees which were injured in one fall fire constitute about 45 per cent of the total number of trees. This injury occurred at the base of the trees. The pine stands examined, which suffered from crown injury, had about the same per cent with crowns injured 80 per cent or more. While the hardwood trees have healed some of their scars, the pine has been subjected to insect attack which increased the mortality.

Chestnut Replacement Study (M-3)

Active work on this project occupied Korstian the greater part of the month. Cooperation was arranged with the Northeastern Forest Experiment Station and the State forestry organizations of Pennsylvania and New Jersey. Korstian left Asheville June 11, paid brief visits to Washington and Harrisburg, and began his field work in Connecticut. This consisted principally of the tally of reproduction and the determination of growth in sample plots established years ago, before the appearance of the blight. Incidentally Korstian was able to secure in Connecticut additional yield sample plots of southern white cedar for his study of that species (TS-193.)

Cooperation in Forest Entomology

Messrs. A. A. St. George and A. H. MacAndrews, of the Bureau of Entomology, were assisted by Korstian in the establishment of their camp at Bent Creek, in the Pisgah National Forest.

Visitors

Among the visitors to the Station during June were W. W. Ashe and C. G. Smith, of the Washington office, and Professor Woodbridge Metcalf, of the University of California. Professor Metcalf gave a day's time to assisting Korstian in the tally of plantations on Clingman's Peak.

FREMONT EXPERIMENT STATION

June Activities

After the first few days spent at the Station on miscellaneous work, Bates left on June 9 for the Black Hills and Harney Forests where he remained until July 1, remeasuring permanent sample plots (Mt-1), installing additional ones in the same project, initiating the growth study by increment borings on both Forests, and going over a grazing problem which is localized in the westerly portion of both Forests. Splendid cooperation by District office and local men was had on all of these projects.

The outstanding result of the plot remeasurements, of the increment-borer work, and of general observations made, is the conviction in Bates' mind that the crying silvicultural problem of the Black Hills region is the thinning of reproduction stands at an early age. This need is demonstrated in the small size of the trees and low lumber yield of the great majority of virgin stands, in the stagnated growth of many pole stands which have developed in an overcrowded condition, and in the impossibility of securing stimulated growth by ordinary commercial cuttings, if the stands have attained to merchantable size only after a slow development. Trees 10 inches in diameter at 100 years of age have splendid potentialities for additional growth, but trees of the same size at 200 years of age are merely an incumbrance. In Bates' opinion, an expenditure of $2 to $3 per acre on sapling stands 20 years old is financially justified, and such treatment as could be given at this cost would greatly augment our chances for meeting a heavy demand in the Black Hills 80 or even 50 years from now. There are tens of thousands of acres of reproduction in the region which need such treatment at this time, being excessively overstocked.

Another silvicultural problem is the elimination of brush burning on sale areas, especially on the poorer soil types. This should be given consideration by Management and tried out on a scale large enough to demonstrate its effect on the fire hazard.

During a cross-country trip to the Black Hills, Bates had a long-desired opportunity to make observations on the eastern extension of the western yellow pine forest in Colorado, Nebraska and South Dakota. It has long been felt that this was controlled by soil conditions, but not until this time has it been possible to name them. Although the samples obtained have not been analyzed, it now seems pretty clear that the controlling factors in the initiation of yellow pine forests under semi-arid conditions are expressed in soil receptiveness and soil retentiveness of moisture. Thus neither a heavy clay which sheds rainfall, nor a pure sand (like the Nebraska sandhills) which lets the water sink too readily, contains a large enough water supply to establish yellow pine seedlings. The ideal situation is presented when a fairly heavy soil is covered by gravel which retards run-off and also serves as a mulch. Another favorable situation exists where water percolating through a foot or two of sand strikes a rock bed and is brought to the surface on the rock layer. This is a common situation in all of the Pine Ridge region of northwestern Nebraska and similar sandstone areas of eastern Wyoming.

There have been no special activities at the Station during June, the routine work on experiments occupying practically all of Roeser's time. These are primarily the transpiration, heat-resistance and source-of-seed experiments.

July Plans

After a day or two in the office to catch up very necessary items, Bates will go to the Medicine Bow July 6 for a program corresponding very closely to that conducted in the Black Hills region. It is probable that Roeser will join him on the Medicine Bow just before work is completed there, to be initiated into the increment-borer study (ME-6) after which (July 20) Roeser will take up this work on the Uncompahgre for a week or 10 days, and Bates will return to headquarters for the remainder of the month.

A vocational student from Colorado Agricultural College, Mr. Smiley, is expected to join the Station staff July 15 for the remainder of the summer.

LAKE STATES FOREST EXPERIMENT STATION

Three field projects were actively carried on during this month, (1) the jack pine yield study, (2) the study of the results of artificial reforestation, and (3) the analysis of fire data.

The yield study of jack pine has been completed in Wisconsin where the opportunity for locating sample plots was excellent and the work progressed very rapidly with a crew of three men, Wackerman, Wilson, and H. C. Mitchell. At the end of June Wackerman moved over to the Upper Peninsula of Michigan to complete the field work on jack pine there. The Michigan Conservation Commission has approved a cooperative fund of $1,500 to be spent in the study of jack pine and other field projects in Michigan this summer, the Conservation Commission paying the salaries and expenses of temporary assistants up to $1,500.

Kittredge finished his survey of the field plantations in Minnesota and moved on to Michigan. His study of field planting in Minnesota revealed the snowshoe rabbits as the chief menace to successful reforestation. During the last 10 years over 8,000 acres have been planted in Minnesota with pine and spruce by the National and State Forest Services. These plantations on the whole did well up until the last two years when the snowshoe rabbits became so numerous that they are eating off the tips and needles so severely that the trees are dying. In some places, the destruction is already complete; in most of the others, severe damage has been done. Kittredge made numerous counts of the trees damaged by rabbits. In the Minnesota National Forest, 79 per cent of the planted white pines on one area had been eaten off by rabbits so severely that 54 per cent of them will die this year. White spruce planted by the State, near Cusson, showed 96 per cent damaged and over half sure to die. On the Superior National Forest in a plantation of Norway pine, in which 80 per cent to 90 per cent of the trees were living in 1918, less than one per cent of them can now be found at all except as dead stubs killed by the rabbits. Ninety-nine out of a hundred white pines planted in one place in the J. Cooke State Park have been similarly killed. The destruction has been most severe or complete in brushy areas and in the State game refuges where the rabbits are most abundant. It is generally thought that the snowshoe rabbits become most numerous every seven years and then die off from natural causes. The year 1924 seems to be a climax year for

them. Unless the rabbits die off or can be controlled by removing the law protecting them and systematically killing them, most of the present plantations are doomed and any further reforestation operations would be a waste of money. The damage is probably fully as large in natural reproduction but no counts have been made so far on the natural growth.

A self-recording hygro-thermograph has been placed at Cloquet and daily readings of relative humidity are being received by the Station from Ely, Cass Lake, and Grand Marais and also from a number of the rangers in the State. Fire statistics for the last 10 years for Minnesota have been compiled by ranger districts. These are now being worked up by 10-day periods. Two temporary assistants are helping Mitchell in the compilation of the data. After the work of the compilation of the Minnesota fire statistics has been fully organized and is in smooth running order, similar work will be started in Michigan and Wisconsin.

A rather hasty trip was made to the Upper Peninsula of Michigan for a conference with the Cleveland-Cliffs Iron Company on the inauguration of the study in the methods of cutting and brush disposal in northern hardwoods. The matter has now been presented to the president of the Cleveland-Cliffs Iron Company and a decision is expected daily. The operations of the Cadillac-Soo Lumber Company at Sault Ste. Marie were visited with the view of determining the possibilities of field studies there also.

The two Fords, the purchase of which was authorized, have been delivered and are now in service, one by Wackerman in the Upper Peninsula of Michigan and the other by Kittredge in the lower part of Michigan.

Investigative projects for the Station in the form of project sheets have been submitted to Washington for approval, together with working plans for several of the projects.

CLOQUET FOREST EXPERIMENT STATION

The activities connected with the nursery, the distribution of stock, transplanting and establishment of new seed beds (150 new beds) have been completed during the month. The present capacity of the nursery will be maintained.

Hansen has also given considerable time to the preparation of an exhibit for the Land-Clearing train. This exhibit emphasizes the value of trees as an agricultural crop.

For the first time signs are now erected marking the boundaries of the Forest, as well as portals at one entrance to the Station with appropriate sign.

Mr. Probstfield, a graduate of the University of Minnesota, who last year took post-graduate work at Yale, has been assigned to the Cloquet Forest Experiment Station to take the place of Wiggin, who resigned during the winter.

Addresses during the month:

Mr. Kittredge made his maiden speech before the Southwestern Michigan Lumbermen's Club, at Sturgis, Mich., on June 17, in place of the Director who was unable to attend.

Articles during the month:

J. A. Mitchell	Cut-over Areas Need Reforestation. Gopher Countryman, June, 1924.
A. E. Wackerman	Rate of Growth of Jack Pine Being Studied. Submitted to Journal of Burnett County, Grantsburg, Wis.

PRIEST RIVER FOREST EXPERIMENT STATION

Except for a week of office work by Weidman and Gisborne in the middle of the month, the staff spent all of June in the field. Most of Weidman's time was spent at the Priest River field station, although he also visited Savenac Nursery and made a short field trip on the Lolo Forest. At Savenac he and Wahlenberg had a conference with Mr. M. H. Lapham of the Bureau of Soils. The nursery soil was examined in connection with the possible harmful effect of the chemical weed eradication treatment. The possibility of a preliminary soil survey of the demonstration forest at Priest River received favorable discussion and the initial steps to bring that about have been taken.

Larsen and Haig were engaged in the spring examination of several sample plots at the field station during the latter part of May and the first few days of June. Thereafter they both proceeded to the St. Joe Forest, where they were joined by two field assistants. Larsen, with one assistant, has been working most of the month on his study of reproduction after forest fires. He finished the study of one area near Falcon, Idaho, and is now working on another large burned area 30 miles by trail up the St. Joe River.

Since helping Larsen early in the month Haig and his field assistant have been engaged on the white pine yield study near Marble Creek, Idaho. The field work here has been on the subject of methods of applying normal yield. The first work is being done in an excellent body of 50-year-old timber.

After finishing the calibration of the duff hygrometers early in June, Gisborne installed three of them near the experiment station in positions representative of moist, medium and dry fire types. One instrument is located on a fully forested northwest slope which dries out rather slowly; another is located where it will reflect the duff conditions under the partial overwood of a timber sale; and the third is placed on an open flat, both clear cut and burned over, where the materials dry out most rapidly to the highest degree of inflammability. These three instruments are all placed close to the elevation of the experiment station, approximately 2,300 feet above sea level. A fourth instrument will shortly be located near the Experiment Station Lookout at an elevation of about 5,900 feet. This is in the subalpine type and is representative of the forest fire conditions prevailing at the higher elevations.

With Gisborne's aid a chart showing the diurnal readings of the instruments in the driest and the most moist sites is being posted daily in the District Forester's office of Operation. The reports from the experiment station are telegraphed to Missoula each morning. With this information and the daily Weather Bureau forecast for northern Idaho, the fire desk is kept constantly informed of the inflammability conditions prevailing in the vicinity of the experiment station. It is possible with this information to know very closely what the fire danger for this locality will be 24 hours ahead. Similar charts will be furnished to the Forest Supervisors of the Kaniksu and Pend Oreille Forests and the necessary information to keep them posted will be supplied currently by telephone.

Gisborne prepared a statement on the weather outlook for the two ten-day periods ending June 30 and July 10 and this was issued as a District circular letter to forest supervisors on June 18. It was based both on statistical probabilities and the sunspot weather forecasts. The May letter on the same subject proved substantially correct. Although the rains forecast for May 23 to 25 were somewhat spotted in distribution throughout the District, they were effective in checking the epidemic of forest fires which was giving such serious trouble at that time.

During his short absence from the field station in June, Gisborne inspected the evaporimeters at Savenac Nursery and visited the Supervisors of the Coeur d'Alene and St. Joe Forests, from whom he received valuable suggestions regarding the fire studies. From his statistical study of meteorological conditions of past fire seasons, Gisborne states that present indications point toward a drier July, August and September than was the case last year, but not equaling the intense drought of the same period in 1922.

At Savenac Nursery, Wahlenberg found that the early drought this year has had a very perceptible effect in decreasing survival in the new plantations. March, April and May were locally all subnormal in precipitation. June rains, however, have checked the loss. By June 24 the monthly precipitation was 0.34 inches of normal.

One complete field examination was made of the principal plantings of last spring, covering 8,800 trees of the field survival project. Definite results cannot be given now for two reasons. First, the condition of the trees is still changing rapidly and, second, the figures gathered have been but partially compiled. Within the range of tests made, however, it is indicated that survival to date is higher by about 4 per cent with each two inches increase in root length. These differences are not noticeable on the west slope, but show quite clearly on the south slope. In the test of size classes the largest trees, comprising one-quarter of the total lot, are about 10 per cent higher in survival than the medium and small grades, which comprise three-quarters of the total lot. This is shown with equal clarity for both age classes 1-2 and 2-0. Direct comparisons of the two aspects and the two age classes will be worked out later, and it is expected that the results of laboratory examinations will be very useful in interpreting the final results.

At the demonstration forest, Kempff finished the rather intensive slash disposal job which engaged much of his attention this spring. It will be recalled that this involved a clean-up of the debris following the salvage sale of one and half million feet of timber killed in the forest fire of August 1922. A crew of 20 men has been engaged on this job. The completely cleaned-up area covers about 50 acres. A portion of the area including 33 acres is being retained with the debris exactly as left by the fire. Both areas are to be planted and followed as a demonstration project of the two methods of treatment.

This year's work on the Benton Creek road has begun. It is hoped to finish the last lap of 1-1/3 miles this summer. The total length of this road will be a little over three miles and will open up for intensive management the south half of the demonstration forest.

In addition to occupation with the above work and with improvements, Kempff has spent several days with Weidman inspecting the planting area, permanent fire line, the road grade and the slashed area, as well as looking up the next annual cutting site and sites for the location of more permanent sample plots.

The field station was visited in June by D. T. Mason of the firm of Mason and Stevens, and by Major Kelley of the Washington office, together with Messrs. Flint and Fitzwater. In connection with the radio station, we had an interested visitor in the person of Mr. Carson, manager of the Western Electric Company of Spokane, who came in the company of Telephone Engineer Adams.

SOUTHERN FOREST EXPERIMENT STATION

(May Report)

General

Administrative details, such as figuring out how much we are likely to be in the hole by the first of July, and review of a large number of lamentably dusty reports by various members of the staff occupied Forbes the greater part of the month.

A. C. Anderson of the Bureau of Soils completed his field work at Urania early in the month, and spent a few days in the New Orleans office writing up his notes and putting the finishing touches on his map. Thanks to the generous cooperation of the Bureau of Soils, we now have soil maps, much more detailed than the ordinary county soil maps, of our 200 acres at Bogalusa, the 650-acre Tate Lease at McNeill, and the 1500-acre Greeley Pasture at Urania. In addition to the soil data we have first-class maps of roads and natural features, on the highly satisfactory scale of 16" to the mile. While at Urania, Mr. Anderson visited practically all of our projects outside of the Greeley Pasture and took a sufficient number of samples to give us a thoroughly satisfactory idea of their soils. Mr. Anderson is rounding the whole job out with written descriptions of the soil types encountered and their suitability for agriculture and forestry.

Early in the month Forbes made a flying trip to St. Louis at the expense of the Concatenated Order of Hoo-Hoo to address the initial gathering of the Friends of the Forest. This is the name which the Hoo-Hoo have selected for use in their National campaign for forestry in cooperation with the Boy Scouts. Mr. Truax of the Laboratory was also among the speakers. Hadley spoke before the Bogalusa Literary Society on forestry and the work of the station. Forbes attended the annual meeting of the Southern Cypress Association and the monthly meeting of the Southwestern Hardwood Manufacturers' Club, both in New Orleans. At the latter meeting the president of the Hardwood Manufacturers' Association, Mr. Norman of Louisville, Kentucky, was quoted as prophesying that New Orleans within ten years would be the center of the hardwood industry of the United States.

Among our visitors at New Orleans were Mr. J. E. LeMieux of LeMieux Brothers, timber cruisers, who wished to know how fast pine trees left as culls in early logging are growing; Mr. M. Juhlin-Dannfelt of Sweden, who visited Urania also; Mr. Koehler of the Laboratory, who spoke before the hardwood meeting above mentioned; Mr. Cuno from Washington, whom we told there was a great deal more dogwood and persimmon in the Gulf Coast States, particularly Louisiana, than we have been credited with; and Mr. H. K. Avery, Research Specialist of the Association of Commerce, who wished to know how much holly is available in Louisiana for distillation of a proposed new "drink."

Mr. Hadley spent a day in the office early in the month. At McNeill he spent half a day very profitably with the legume expert of the Bureau of Plant Industry, Mr. Peters. In addition to Mr. Dannfelt, Major J. G. Lee of the Louisiana State University visited Hine at Urania.

At Starke Wyman showed the naval stores work to Assistant District Forester Evans of D-7 and Supervisor Hill of the Florida National Forest, and then accompanied them on a three days' visit to the Ocala Division of the Florida Forest. Wyman was particularly interested in some stands of five and ten-year-old longleaf, on private lands within or adjacent to the Forest, which the District hopes to purchase, and which within a very few years will be available for research work if such work appeals to the District. Wyman reported remarkable growth of longleaf pine on ploughed sand pine sites. Deputy Supervisor Rogers sowed the experimental area broadcast in the spring of 1922, and some of the seedlings are now as tall as 19 inches. "At least 20% of the trees have already started to shoot up," says Mr. Wyman, and then draws unnecessary and invidious comparisons with some of Mr. Hine's longleaf at Urania. Hine comes back strong, however, by recording that some of the loblolly seedlings on our natural reproduction plots at Urania reached 5.9 feet in two years, and by the end of May of this year had already added three feet. Mr. Wyman spent a day and the greater part of two nights on a trip to Waresboro, Georgia, where he made some weighings of gum on one of Dr. Cary's experiments.

An interesting offer of cooperation from the Alabama Polytechnic Institute at Auburn was renewed during the month. The Institute has recently acquired some forest land, probably just within the Piedmont, and has inquired as to our cooperation in artificial reforestation and possibly other lines. When we were informed that the University contemplated selling some standing timber, apparently without provision for future growth, Forbes made an earnest request to the authorities that a more enlightened policy be adopted by this Institution, one of the leaders in the South, and also put the matter up to the new State Forester of Alabama. A three-cornered cooperation may prove to be feasible and desirable.

Protection

Fire. Hine's report on the establishment and first year's work on the loblolly fire studies at Urania was reviewed by the Director. The winter burn in the youngest age class continues to yield interesting data. Hine finds that those of the saplings which retained any green foliage at all are alive and apparently flourishing. Trees with thoroughly brown foliage but with an apparently healthy terminal bud have put out a shoot, but may not survive the summer. The cambium remained green even on trees showing no growth this year. The plot burned this month seems to have suffered less damage than the plot burned in the winter. This is apparently due to the large amount of

green grass and leafed-out hardwoods in the plot, and to the fact that the fire was started late in the evening. It is quite evidently going to be very difficult to regulate the intensity of these seasonal burnings, or in fact to gauge their intensity. Ordinarily we are confident that a spring burn would be very much more destructive than a winter burn.

This year's fire in the Roberts plot (longleaf) appears to have done comparatively little damage. Hine visited a hurricane area not far from Urania and made some correlations of fire damage and blowdown. Out of 20 trees taken at random 11 had broken off at the point where fire had eaten in or rot, presumably induced by fire injury, had worked. Of the other nine trees five showed more or less fire scarring. These treesrange from 18 to 35 inches and averaged 25 inches.

Grazing. Hadley moved to McNeill on the first of the month, and put in almost all of his time in the Tate Lease. With a little help from H. R. Reed of the Coastal Plain Experiment Station and the Director he finished up the location and staking out of all the 52 quadrats, and nearly completed the individual work of quadrat mapping. Hadley has profited very greatly from his contacts with Messrs. Reed and Greene, and as a result of thorough discussion of methods the project seems to be in excellent shape. The following forage types have been adopted in mapping of the 1/100-acre quadrats, this being the first attempt, so far as we know, to recognize vegetative types or associations in the Coastal Plain from the grazing point of view: Andropogon tener and associated species (wire grass type); Andropogon scoparius and associated species (broomsedge type); Panicum species; true sedges (marsh or bottomland sedge type); Axonopus compressus, carpet grass; Cynodon dactylon, Bermuda grass; Paspalum dilatatum, Dallas grass.

An excellent herbarium of the native grasses, herbs, and other non-arborescent vegetation is being built up by Mr. Reed, whose work for the Bureau of Plant Industry has hitherto been chiefly with introduced species. Hadley has drawn up a detailed statement of methods followed in this project, to supplement the very general working plan earlier prepared. He has had the advantage of some stenographic help at McNeill, thanks to the Coastal Plain Station.

Disease. Hadley has had some interesting correspondence with Dr. Hartley relative to damping-off and injury from chemical weed preventives. Seedlings apparently suffering from each type of injury were sent to Dr. Hartley for final diagnosis.

At Urania Hine has undertaken to burn the grass during the winter from certain quadrats laid out by Professor Chapman of Yale in a study of the longleaf pine leaf disease. Professor Chapman aims to free seedlings on certain quadrats from all competition, and has removed brush and hardwood species from them.

Management

Hine feels that the brush on the brush disposal plots at Urania from now on will be a hazard secondary to the vegetation which has sprung up since the cutting. He reports pine limbs and tops as being very rotten; 6 to 8-inch logs having decayed to a 2" or 3" heart. Forbes is not yet thoroughly convinced, however, feeling that the time to appraise the danger from slash is after frost in the fall.

Hine completed the re-examination of the quadrats on the natural reproduction study of pines and mixed hardwoods. Continued observation of adjacent areas convinced him that inadequate seed supply, due to cutting of the stand before the seed crop matured, is responsible for the small amount of pine reproduction. Forbes made a final check of the report on this project, which has seen many vicissitudes and delays, chiefly in New Orleans.

Hine in a moment of unguarded enthusiasm undertook to record in detail the thinning job done by Mr. Hardtner and the Louisiana Department of Conservation, mentioned in last month's report. The job of making a stump and stand table on an acre, and of measuring and mapping crowns took more time than had been expected, but should eventually give us some first-class information on proper spacing of loblolly pine.

Naval Stores

The sale of our slash timber to a local man at Starke we find was never completed. In addition to the routine work of chipping and dipping, Wyman has made a map of both experimental areas, and is maintaining currently his graphs of gum production. The slash pine yields this year are lower throughout than for the same period last year, due no doubt to the six weeks' drought. Erratic is the mildest adjective that can be applied to rainfall at Starke. The usual set of chips was sent to Miss Gerry. The hope of some additional minor projects on Doctor Cary's lands near Sampson Lake has been dashed by the difficulty of securing a chipper.

Forestation

Hadley made periodic trips to Bogalusa to keep close watch on his nursery beds. He finds that he cannot depend for his weeding upon the Great Southern labor, and has been obliged to hire his own. The company's seed beds adjacent to ours have been very thickly sown, and except where decimated by damping off the seedlings have stood so thick on the ground as to make great care in weeding unnecessary. The company now has about four million seedlings. Hadley has been able to offer valuable advice upon more than one occasion, particularly in the handling of damping off,

While on a two days' visit to McNeill, Forbes viewed with Hadley the melancholy remnants of our slash pine plantations on the hill. The fire destroyed practically every seedling planted in the spring of 1923, but the fall plantation seems to have a considerable percentage of survival. The furrows were fresher and the seedlings in them were in some instances considerably below the general level of the burnt vegetation. Both the slash and longleaf plantations on the lower ground within the station fence are doing splendidly. The only danger there is that our planted seedlings will be overwhelmed by the competition of natural reproduction. It is this fact which has given Hadley quite a reputation locally. A native, passing by the planting site several months after he saw Hadley at work there, and noting the splendid stand of seedlings, averred that Hadley had certainly done one fine job!

Forbes reviewed and returned to Hadley and Hine their respective reports on the establishment of plantations at the Bogalusa and McNeill and Urania Branch stations. We find ourselves handicapped by lack of suitable forms for detailed cumulative records.

NORTHEASTERN FOREST EXPERIMENT STATION

June was pre-eminently a month of field work. Westveld spent the entire time on the White Mountain National Forest in New Hampshire, taking temporary sample plots in connection with his study of spruce methods of cutting. Meyer continued taking temporary sample plots in connection with his spruce yield study in parts of Maine. Bowman and Shapiro, the two field assistants who were with him, left toward the end of the month to accept permanent appointments in the western districts. Their places were taken by P.W. Stickel and R. E. Wilson, Jr., graduates of the Yale School of Forestry, and of Cornell. Both men participated in the establishment of permanent and temporary sample plots connected with the chestnut replacement study. Korstian from the Appalachian Experiment Station spent approximately two weeks in the region on this project. Some permanent sample plots consisting largely of chestnut abandoned on account of the blight were revived, and two plots established on the Massachusetts Agricultural College Forest at Mount Toby.

E. W. Gemmer, a graduate of the New York College of Forestry, joined the staff as a field assistant. He has been assisting Behre on his taper study, office work on which has practically been completed for the season. Early in the month Behre made an inspection of the gypsy moth forest management plots established some years ago by the Bureau of Entomology in cooperation with the Service. Later we may wish to make some detailed studies on these, and in the meanwhile we will assist the Bureau of Entomology in necessary cultural operations.

A joint meeting of the New York and New England Sections of the Society of American Foresters was held at the Harvard Forest the latter part of the month. This was probably the largest field meeting of foresters ever held in this country and was a decidedly profitable gathering. Shepard from Washington arrived during the latter part of the month and will be with us throughout July.

General

The work of supervision and administration at this station during the month of June was considerably increased by final word from Washington stating that an increase of $25,000 in our appropriation would become available July 1, and that reclassification would go into effect on the same date. Consequently Forbes spent several days formulating new plans of organization for the station under the new appropriation and in compiling statistics supporting these plans. Mr. G. Burton Shivery of Woodland, Pennsylvania, has been the only appointee thus far.

Hine completed all current field work at the Urania Branch Station and came to New Orleans June 20th.

Mr. Wyman made trips to Paradise and Union Point, Fla., to arrange with Mr. Shingler, Naval Stores Demonstrator of the Bureau of Chemistry, for demonstrations in Starke. During these trips an opportunity was had by Wyman to explain the work being conducted at Starke to several groups of naval stores men.

Forbes left New Orleans for Washington on June 28th, where he will present plans for work and organization of the station under the increased appropriation.

Among the visitors of note at the station during the month were W. R. Mattoon, who spent two days in the New Orleans office discussing southern forest conditions in general, and was later shown over our projects at Bogalusa and McNeill. Mr. E. Baker, agricultural agent for the A. & W. P. R. R., called at New Orleans for general information on reforestation. Mr. Baker was shown over our work at Bogalusa and McNeill.

Protection

Fire. Forbes completed the final revision of his article on fires. At Urania Mr. Hine took notes and measurements on 200 tagged seedlings in the unburned one-quarter acre of the Roberts Plots for comparison of growth with seedlings in the burned area.

At McNeill Hadley assisted in the production of a departmental motion picture sponsored by the Bureau of Animal Industry, entitled "The Green Barrier." This is an educational picture advocating among other things pertaining to animal industry, the elimination of fires and the establishment of carpet grass pastures.

Grazing. All field work on the establishment of Pa-1 project at McNeill was completed and the report on the establishment is under way. In this study fifty-five 100th-acre quadrats have been mapped in detail, separate base maps of the experimental pasture have been prepared to

show first, distribution of seed trees; second, soil types; third, reproduction density types; and fourth, exact location of plots and quadrats, and of course natural features such as drainage, etc.

During the course of the work outlined above many points on methods were worked out in the field and Hadley prepared a supplementary working plan on methods for this project.

Measurements

Forbes and Hine spent a day or two each in reviewing the southern pine growth figures with a view to some additional field work.

A final check was given the figures which appear in Hadley's proposed circular on growth and yield of tupelo gum, and the text was given a last review before transmittal. The manuscript has been submitted to a Board of Review.

Management

At Urania Hine completed the annual examination and remapping of the Mr-1 quadrats and found germination of pine and oak since the last examination in 1922 to be negligible, although many of the less valuable hardwood species were found in abundance. The variable of grazing was eliminated from four of the extensive plots by fencing against all classes of stock.

All seedlings on the ninety-eight 5 x 10 quadrats of the Mr plots in the Greeley pasture were remeasured by Hine.

Wyman made a complete check and review of his Urania brush disposal report and spent some time on his popular article based on this report.

Forbes and Hadley checked over the work that has already been done on the Mc-1 project at Bogalusa and formulated plans for completing the establishment of the project.

Naval Stores

At Starke Wyman supervised the current work of hacking and dipping on the two tracts.

Forestation

Several examinations and seedling counts were made in the seed bed plats representing 20 different variables of nursery practice being studied at Bogalusa. Close-up photographs were taken of each plat.

Hadley found loss of seedling by hand weeding in the Great Southern Lumber Company's nursery to be very severe. This seems to bring out the necessity of working out methods of chemical or mulch weeding. Some work is now being done along this line at Bogalusa.

The seed beds sown at McNeill for quantity production of growing stock are in excellent condition and we are figuring on about 20,000 seedlings being available for distribution this fall.

Seed beds containing seedlings of the different species from 1922 and 1923 sowings are being retained for comparative purposes and detailed study of growth.

SOUTHWESTERN FOREST EXPERIMENT STATION

Krauch returned early in June from a detail in the Washington office. He, accompanied by Ranger Osborn, left on June 7 for an extended field trip in New Mexico. The Santa Fe plantations established by Krauch several years ago were examined. From there he went to the Carson where he is remeasuring sample plots.

Dr. Walter P. Taylor of the U. S. Biological Survey arrived at the experiment station the first of the month to begin a study of rodent life, particularly porcupines. Several porcupines and squirrels will be kept within enclosed areas in order to study their habits. An area of about one-half acre containing seedlings, saplings and trees is being fenced to keep the animals in. It is hoped that these observations will settle the much debated question as to whether porcupines or squirrels are primarily responsible for the girdling of trees in District 3.

Pearson has made the annual spring examination of yellow pine reproduction plots. Fenced areas are everywhere making splendid progress. On areas open to heavy grazing, the big 1919 seedling crop is either gone or is hanging in the balance.

Several plots on the Coconino, Tusayan and Prescott have been selected for conducting thinning experiments. Thinnings in District 3 give rise to a great many problems which apparently have not been encountered elsewhere. Attempts to follow standard European methods often lead to absurd results because of the abnormal character of our stands. As in all other forms of forest practice, rules must be supplanted by common sense. In order to secure uniform conditions of site and stand, it is necessary to deal with very small plots.

DISTRICT 5 - CALIFORNIA DISTRICT

Dunning and Ayres remained in the field until practically the end of June. The work of remeasuring the Luman yield plot on the Plumas Forest was completed, as was the remeasurement of the thinning plot in the pure even-aged yellow pine as well as its control plot. This work was interrupted three times for an aggregate of over a week of fire fighting. The extraordinarily dry season coupled with excessively low humidity and high winds has created a very serious fire situation on the Plumas as elsewhere. It is probably to be anticipated that additional time will have to be dedicated to fire fighting.

Following the first of the fires, Dunning established a plot and tagged the trees to study rate of recovery or death of fire damaged trees. The plot was in a mixed type with yellow pine, sugar pine, Douglas fir and white fir represented.

The reproduction plots near Portola, which were fenced last year were re-examined. No new reproduction was found on any of these plots.

The volume table party which worked from May 15 to June 20 on the Stanislaus has moved to the Plumas Forest where Dunning again started them on their work.

Show's time during the month has been spent almost entirely on the economic study, prosecution of which has been possible because of the assigning of Ayres to help in the field work. At the present stage of the study most of the work has been devoted to securing material from widely scattered sources and no clear-cut conclusions can yet be set down.

During the last week of June, Show attended the meeting of the Pacific Coast Division of the American Association for the Advancement of Science at Stamford University. Two papers were given before the joint session of the ecologists and foresters. These papers were entitled "The Management of Forest Properties in the California Pine Region as a Problem in Applied Ecology" and "Forest Fires as an Ecological Factor in Pine Forests of California."

Plans have been made for securing help from the Tahoe for Dunning during the month of July during which time he will devote his attention to a field study of means and methods of applying yield tables to partially stocked stands. This, of course, involves also an attempt to determine the minimum number of trees under given conditions which can properly be considered as a fully stocked forest. So far it is probably true that most of the 250 plots measured tend toward over rather than understocking. The region in which Dunning will work is characterized by extensive areas of even-aged second growth yellow pine with all possible densities of stand, though with a rather narrow range in age classes. It is very much to be hoped that some light on the vexing question at issue will result from this work.

LIBRARY

Last month there were 845 books and periodicals drawn from the library, and 129 members of the Service and others consulted the library in person. The number of books and articles indexed during June was 256.

MANUSCRIPT NEWS

Priest River

Length and Intensity of Fire Season at Different Elevations in Idaho.
J. A. Larsen (Idaho Forester)

Reforestation by Seed Sowing in Northern Rocky Mountains.
W. G. Wahlenberg (to Journal of Agricultural Research)

Factors Affecting Reproduction after Logging in Northern Idaho.
J. A. Larsen (to Journal Agricultural Research)

Study of Natural Reproduction after Fires. J. A. Larsen.
(Journal Agricultural Research)

Yield and Growth of Western White Pine. J. A. Larsen, I. T. Haig
(Progress Report)

Southern

Growth and Yield of Second-Growth Tupelo Gum. E. W. Hadley (Board of Review)

Experimental Sowing of Carpet Grass on Steam Skidded Cut-over Land.
E. W. Hadley. (Progress Report)

Southwestern

Trees, Shrubs, and Vines. G. A. Pearson. (Flagstaff Women's Club. 5/27)

Washington

Volume Table Handbooks. Munns and Brown (to printer)

Use of Liability Ratings in Planning Forest Fire Protection.
W. N. Sparhawk. (Journal Agricultural Research)

Fremont

Natural Reproduction of Douglas Fir under Different Methods of Cutting. J. Roeser, Jr. (to Journal Agricultural Research)

Forest Types in Central Rocky Mountain Region. C. G. Bates. (Dept. Bul. 1233. Page proof revised)

District 5

Prediction of Second Cut in Forest Management Plans. D. Dunning. (Journal Agricultural Research)

Role of Fire in California Pine Forests. S. B. Show. (Bulletin - to printer)

Forest Fires in California, 1911-1920. Show and Kotok. (Circular 243 for reprint)

District 4

A New Method of Constructing Taper Curves. F. S. Baker. (Journal of Agricultural Research)

Northeastern

Estimating Forest Insect Damage and Progress Report on other Insect Studies. H. B. Peirson (Bulletin 3 Maine Forest Service)

Spruce Budworm in Maine, Progress Report 1923, 1924. H. B. Peirson. (Bul. Maine Department Forestry)

IN PRINT

Korstian, C. F. A Silvical Comparison of the Pacific Coast and Rocky Mountain Forms of Western Yellow Pine. American Journal Botany, May, 1924.

Larsen, J. A. The Forest Fire Season at Different Elevations in Idaho. Idaho Forester, 1924.

Pearson, G. A. Natural Reproduction of Western Yellow Pine. Dept. Bul. 1105. Reprint.

Show, S. B. Some Results of Experimental Forest Planting in Northern California. Ecology. January, 1924.

Wahlenberg, W. G. Circumventing delayed germination in the nursery. Timberman, May, 1924.

Dana, S. T. Forests of Maine. Bulletin 2, Maine Forest Service.

Hadley, E. W. Review of U. S. Department of Agriculture Bulletin by Dunning, Journal Forestry, April, 1924.

Sudworth, G. B. A New Hickory for Florida. American Forests and Forest Life, June, 1924.

Hofmann, J. V. Putting Fire Weather to Work. Timberman, May, 1924.

Dana, S. T. The Northeastern Forest Experiment Station. Paper Mill and Wood Pulp News, April 12.

Wyman, L. Forestry Tests at Starke, Florida. Southern Lumber Journal, April 1, 1924.

McCarthy, E. F. Forests of North Georgia. The Cypress Knee, Georgia School of Forestry, 1924.

Larsen and Lowdermilk. Slash Disposal in Western White Pine Forests in Idaho. Dept. Agricultural Circular 292.

Munns, E. N. The California Forest Situation. Electra Fruit and Garden, May, 1924.

Forbes, R. D. An Inspiring Toast to "The Forests of America." Lumber World Review, May 25, 1924.

Behre, C. Edward. The Prediction of Yields of Young Western White Pine Timber in Idaho. Idaho Forester, 1924.

Frothingham, E. H. Forest Research. Journal of Forestry, April, 1924.